

Force Practice Problems
CP and Honors Physics

1. An elevator is moving upwards at constant velocity, and the elevator has a mass of 300 kg. What is the tension on the cable during this motion? Draw a picture, free-body diagram, write down Newton's second law, and give an answer. [2940 N]
2. An elevator is moving upwards at with an acceleration of 2.6 m/s/s , and the elevator has a mass of 300 kg. What is the tension on the cable during this motion? Draw a picture, free-body diagram, write down Newton's second law, and give an answer. [3720 N]
3. An elevator is moving downwards with an acceleration of 4.8 m/s/s , and the elevator has a mass of 300 kg. What is the tension on the cable during this motion? Draw a picture, free-body diagram, write down Newton's second law, and give an answer. [1500 N]
4. A car with a mass of 1200 kg is accelerating at a rate of 3.1 m/s/s and has a drag force of 150 N and a force of static friction of 49 N. Find the applied force from the engine that is causing the motion of this car. Draw a picture, free-body diagram, write down Newton's second law, and give an answer. [3919 N]
5. Two people are attached by a rope on a frictionless surface. Person 1 has a mass of 100 kg and accelerates at 5 m/s/s . If Person 2 has an acceleration of 4 m/s/s , what is this person's mass? Draw a picture, free-body diagram, write down Newton's second law, and give an answer. [125 kg]
6. An object is struck with two forces simultaneously. One force is north at 150 N, and the other force is west at 278 N. If the object has a mass of 23 kg, what is the acceleration (magnitude, angle, direction) of the object? Draw a picture, free-body diagram, write down Newton's second law, and give an answer. [13.7 m/s/s , 28.3° , North of West]